Patron - Dennis Morris

Central North Field Naturalists

CNFN *the* Natural News

Jan - Feb 2001

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Walks

January 21, Combined outing with Launceston Club. Meet at 10 am at the Longford Post Office. Chris Spencer will be taking us to a wetlands rehabilitation area. The day will concentrate on wetland ecology including the microhabitats and invertebrate communities. There will be pinned specimens along with the identification of live specimens in the lagoon.

February 18, Penguin Shelf tide pools. Meet at the Penguin Park at 1 pm for a picnic lunch. The low tide is at 5 pm, so we will start following it out about 3 pm and finish about 6 pm.

March Kelcey Tier Reptiles (Date to be set) The identification and interpretation of our reptiles in Tasmania. A combined walk with Bush Care and Land For Wildlife participants. Birds, plants, invertebrates and other values to be seen, also.

Memberships for 2001 are due by March 1st
Individuals - $15, Families - $20, Independent Young adults - $5 Please pay Sarah, or send cheque to: 999 Denmans Rd., Birralee 7303

Book Review *by Sarah Lloyd*

"One of the most noticeable things about Australian ants is the large number of species and individuals found at most locations, especially in the arid zones. This great abundance, combined with their predatory, scavenging and seed feeding behaviour, makes them one of the most important groups of terrestrial animals in Australia"

I have long been on the lookout for a comprehensive guide to the ant fauna of Australia, so when Australian Ants: Their Biology and Identification was advertised, I couldn't resist. And what a worthy addition to the library it has proved to be! This introduction to Australia's ants contains information on their general biology, distribution patterns, and an overview of their life cycles, nesting and feeding habits. But best of all, this book features an excellent illustrated key to all 103 ant genera known to occur in Australia.

At first this key may seem a bit daunting as it is necessary in some cases to count the teeth on the mandibles or the segments of the antennae or palps--not easy features to see. However with the aid of a 20x microscope and a little practice, it doesn't take long to realise that it is, in fact, easier than keying out species in the *Asteraceae* family after all.

Shattuck, Steven O. (199x), **Australian Ants: Their Biology and Identification**. Available from CSIRO PUBLISHING PO Box 1139 (150 Oxford Street) Collingwood, Vic 3066, Tel (03) 9662 7666, email: sales@publish.csiro.au Approx. $60 Soft cover

ALONG THE PAROO

by Ron Nagorcka

(1) Wandilla 24/7-1/8/00

Wandilla is an old sheep station on the banks of the Paroo river not far south of Cunnamulla —now part of the same amalgamated property as Penaroo (see previous Newsletter.) Its ecology is very different to that "high and dry" country. It is very flat and the river (still part of the Murray-Darling catchment) is in fact a wide swampy plain containing innumerable small channels and billabongs. One of the two main channels is flowing — just. In fact we followed it for quite a way one day thinking it was flowing in the wrong direction. This area has many magnificent old River Redgums *E. camaldulensis*, Black box *E. largiflorens*, and another Eucalypt species with a wonderful varnished-brown upper trunk which we can't identify with our limited on-board library. The Acacias on the flats include *A. stenophylla* —a beautiful large needle-leaf tree, and the spectacular Bignonia Emu-bush *Eremophila bignoniiflora* which grows to a height of 7 metres. The soil is grey muddy/sandy loam with no rocks. While there seems to have been little or no clearing of vegetation on the plain, there are fence remains in many places and the erosion (presumably caused by the treading of many hoofed feet over the last 150 years) has been devastating —with grand old trees falling into the river as the soil around their roots is washed away. It is hard to imagine what this great flood plain was like 200 years ago, but I imagine that the watercourses would have been thoroughly vegetated and not at all like the deep ditches that are continuing to develop at an alarming rate.

The banks of the river and the surrounding area have red soil and are dominated by Bimblebox *Eucalyptus populnea* and a variety of Acacias including Mulga *A. aneura*, Yarran *A. omalophylla*, *A. brevensa ssp. wayi* and 2 more species with silvery leaves we can't identify. Among the understorey plants are several *Eremophila* species —the desert-loving genus so ubiquitous in these parts. There are also Hakeas and Lignum (*Muehlenbeckia* sp.) and many interesting grasses as well as Asteraceae of various descriptions and beauty.

The bird life is not as diverse here as it was at Penaroo. There are many Grey Shrike-thrush which have been doing a great deal of counter-singing, and seem to introduce a new variation into their song each day. Like many other of the birds here, they also occur in Tasmania. The list includes the Grey Butcherbird, Black-faced Cuckoo-shrike, Welcome Swallow, Common Bronzewing, Spotted Pardalote, Striated Pardalote, Kookaburra, Black Duck, and Wood Duck.

Some birds however —like the raucous Blue-faced Honeyeater soon make you feel away from home. Then there are the treecreepers —occupying an ecological niche that in Tasmania is filled by some Honeyeaters —and the Babblers (very appropriately named). We've seen the rare

Hall's Babbler

Pomatostomus halli

Halls Babbler here again as well as the Grey-crowned. These are birds which are suffering a serious decline in more settled areas of the country.

Along the river we've seen Sacred Kingfishers, Spoonbills and White-faced Herons, but the undoubted highlight has been the discovery of a pair of Square-tailed Kites nesting in a large Eucalypt over the river channel. This bird —endemic to Australia —is listed as vulnerable and considered very rare. We suspect that we also saw a Black-breasted Buzzard, but not for long enough to make a positive identification.

It is often the birds that you expect to see, but that do not seem to be around that give clues to the ecological health of a place. One morning we walked perhaps four kilometres across the river flats before encountering our only sighting of a wren (a Splendid Fairy wren). This seems strange, as there is plenty of grass and suitable habitat, and at nearby Penaroo we encountered 3 different species. However, the area is very much dominated by Yellow-throated miners and White-plumed Honeyeaters who are very aggressive and chase away all other birds. In dry years you'd imagine the place would be even less hospitable for wrens —another indication that ground-dwelling birds and those dependent on a healthy understorey are in serious decline.

On the positive side we've observed three different Pardalotes —the Red-browed (which doesn't occur in SE Australia), the Striated and the Spotted (both of which occur in Tasmania.) To record a Spotted Pardalote was a surprise, as it is well out (by hundreds of kilometres) of the distribution shown in our field guide (Pizzey). Maybe the wet season provided incentives to go further afield than usual.

One afternoon a Spotted Bowerbird landed nearby and made its usual harsh and breathy vocalisations with some

occasional variations which I decided to record. I was about to turn off the tape-recorder when the clear and unambiguous sound of a Whistling Kite emanated from the bowerbird. If I hadn't actually seen the bowerbird do it, I would have looked around for a large Raptor! It went on to imitate a nearby Australian Raven —and close listening to the recording reveals a brief heron imitation as well. Another nice moment of imitation at Wandilla was the Grey Shrike-thrush which adjusted the beginning of its song to match that of a nearby Crested Bellbird.

Our reptilian observations included a shingleback lizard, and a small fast skink on the sunny verandah of the Shearers quarters where we stayed. As nearly always in these parts, there were geckos in the firewood. There was plenty of water around the place, but as at Lake Bindegolly we did not see or hear any frogs.

We did encounter an interesting new fungus called *Pisolithus tinctoria* —which has beautiful dark brown chocolate coloured spores and was apparently eaten and used as a dye by aboriginal people. Other fungi include *Tulostoma* spp, Earth-stars, and more Birds-nest fungi, but no *Podaxis pistillaris*.

(2) Corni Paroo Waterhole. 1/8/00 —8/8/00

About 60 kilometres south of Wandilla the river narrows to a long natural waterhole. We camped in a sheltered spot which seems to have been used as a prime camping spot for many thousands of years —there are flints all over the place and two old trees we noticed had coolamon size pieces of bark cut out of them. In the pub at Hungerford we saw a newspaper photo taken at the last large ceremonial gathering of the local aboriginal people. It was of six proudly decorated men —bodies all painted and decorated with what looked very much like Egret feathers.

This part of the Paroo is in the northern part of the Currawinya National Park. The main attractions of the park —its two large lakes —one fresh and one salty — are inaccessible at the moment as the roads are closed after 2 good years of rain and high floodwaters. So this waterhole is full and brimming with fish —mostly "yellow belly" but also European carp which seem to have invaded the whole Murray/Darling system, even though the Paroo seldom actually flows into the Darling but ends as a vast "overflow". They provide an easy meal for a wonderful variety of waterbirds fishing from the many trees dead and alive that line its banks —Egrets, Spoonbills, White-necked and White-faced Herons, Pelicans, Whistling Kites and a singular new species for us —the Nankeen Night-heron. A few juveniles hang about this section of the river and are greatly entertaining.

Quite close to the camp site is a large dead tree which is a favourite sitting spot for many birds — demonstrating again how important dead trees are to a healthy ecology. One morning, 6 galahs flew into it, followed shortly thereafter by a pair of Whistling Kites which obviously thought a galah would make a tasty breakfast. They flew at the galahs, forcing them into the air and then proceeded to chase them through the sky until one was unfortunate enough to be cut off from its fellows. Whether it did become breakfast I don't know as the Kites then proceeded to chase it out of sight up the river.

Near the campsite there is a lot of evidence of pastoral activity which began here in the 1860s — including the rusting hulk of a steam-engine which was used to pump water for flood irrigation to grow wheat and lucerne to feed horses. A seeder, plough (one furrow, horse drawn) and a binder (used to make sheave hay) are all abandoned in a machinery shed with a roof designed to keep out the sun rather than the rain. 70 men were once employed on this property just building fences! The soil is not as red as Wandilla — and appears to be more sandy.

We obtained most of this historical information from the knowledgeable young Ranger who arrived one day to collect fees from us -$7.70 per day. This is a place where nothing is provided apart from a beautiful spot to camp, and we were perfectly willing to pay for that privilege. It is interesting that such a remote National Park is thoroughly policed —unlike the increasing neglect being shown in Tasmania to remote parks. A Bilby recovery program is being undertaken in another part of the park. A high fence is being erected to keep out foxes, cats and the like. This ranger knew his birds and was very interested in Sarah's observation of Plum-headed finches —a new record for the Park.

Here we find the fungi *Pisolithus alba* (rather than *tinctoria*) and *Podaxis pistillaris* has turned up again along with a magnificent specimen of a *Battarrea sp.*

While the eucalypts are the same as at Wandilla, there are yet more and different *Eremophillas*.

Once again —despite the healthy understorey— we have seen no wrens or frogs or even reptiles here. This may be explained somewhat by previous land management practices, or

this may be due to the many feral cats we heard at night by the river.

On our way south back into New South Wales we took in another of the Parks attractions known as "the granites" —basically a high granite outcrop with a good view. Most interesting however were the mound springs nearby —small hillocks with pools of muddy water in depressions at the top —one of the more intriguing aspects of the great artesian basin.

(3) Peery National Park 8-9/8/00

This Park is a days drive south from Currawinya in NW New South Wales —not far east of the opal mining town of White Cliffs (which is largely underground). We were not able to stay long as the park (newly created by the purchase of a pastoral property) is not in fact open for the public to explore, and no camping facilities are provided. But even a slow drive through it is well worthwhile as it is a spectacular place —containing most of the very large Peery Lake which is part of the Paroo Overflow. The Paroo apparently seldom makes it all the way to the Darling, but ends in a series of lakes and marshes. There seem to be no roads to Peery Lake or into the overflow area at all —perhaps because they wouldn't last long —one road we would have taken had been washed out by the latest flood down the Paroo.

There are also some quite spectacular landforms — high red crumbling cliffs —all the more prominent in an otherwise extremely flat landscape. The park was apparently purchased to protect the mud-springs habitat of a rare plant and also contains many significant archaeological sites.

Away from the lakes the area seems arid even this year —red gibber plains —an obviously ancient landscape. Still this impoverished soil supports a variety of Acacias and Eremophillas, Cassias and a few small hardy Eucalypts. Our short stay included a sighting of a Chestnut crowned Babbler, a Chestnut-breasted Quail-thrush, and a fascinating nocturnal gecko —stocky, light in colour and with very large eyes. (Our research on returning home indicates it was probably the Variegated Dtella *Gehyra variegata*.) It was catching insects attracted by our light, by placing itself on an insect screen, so we had a really good look. We glimpsed another gecko and a skink —obviously this is a great place for herpetological shenanigans.

Chestnut Quail Thrush

Until recently this place also supported a lot of sheep. The large shearing shed seems quite recently built, but obviously economics has recently dictated the end of farming here. In a place like this, one wonders at the optimism that could ever have seen it as a possibility.

It's interesting when you travel to get a feeling for how the land is seen by the people. The Hulloo Shire Council (taking in Lake Bindegolly) announces in a tourist brochure featuring cattle being driven through a flooded river that they "like things the way they are" —and that the abundance of native vegetation in the area is "perfect for grazing cattle." Sound familiar? Meanwhile the problems of erosion alone in these delicate arid environments must be obvious even to blind freddy. Even looking at this country in its prime after good rain, one wonders how long it could sustain any pastoral industry.

Fortunately the NSW government in particular seems to have a quite enlightened policy towards those parts of the State that nobody wants to make money out of any more, and has purchased some large and important properties for conservation (not for tourism!) —such as Gundabooka and Peery. However even the removal of cattle and sheep in these new Parks leaves the problems of foxes, cats, goats and pigs requiring extensive eradication programs. (Goats are currently worth good money by the way. Many landowners do not kill goat nannies with kids these days and we travelled through places deliberately stocking them.)

Despite all this, I can only encourage people to experience the arid zone. For Tasmanians, (or for anybody who lives in the "settled districts"), it is like visiting a different country —one so vast that nature sings on a different scale. Grand and exquisite —and pretty tired even before *Homo sapiens* (let alone its european variety) came along. Wonderful worn-down country.

Moths

by Sarah Lloyd

If you have ever wondered why large numbers of moths sometimes appear on rainy nights, or why some moths seem to be excessively hairy, or about the differences between moths and butterflies. Read on!

The Order Lepidoptera includes those insect with a covering of scales on the head, body, legs and wings, i.e. moths and butterflies. But the difference between moths and butterflies is an artificial one. Butterflies are simply several day-flying families of moths that have clubbed antennae, a habit of sitting with their wings upright and that lack a wing-coupling spine along the hind wing called a frenulum. No moths have all these characteristics in combination although there are a small number of day-flying moths with clubbed antennae.

In the world of invertebrates, the order Lepidoptera is second only in numbers to the order Coleoptera (Beetles). To achieve this remarkable success, moths have undergone numerous adaptations which allows them to survive in a wide range of habitats. In particular, modifications in structure, physiology and behaviour enable them to withstand adverse weather conditions, adapt to a wide range of food plants and avoid or discourage attack from vertebrate and invertebrate predators.

Approximately 160,000 species of Lepidoptera occur worldwide with an estimated 22,000 species living in Australia. The relative richness of the Australian fauna is due to the complex evolutionary history of the continent and the great diversity of habitats. However, of these 22,000 species, only about 2% (400 species) are butterflies.

Only about half of the Australian moth fauna has so far been named, mainly because of the unusually high proportion of very small species (microlepidoptera) that occur here. Recently a greater interest has been shown in these small moth species as they have been identified as having the greatest economic impact, especially those in the families that attack crops or assist in the control of weeds.

Moths and their larvae depend almost entirely on plants or material of plant origin for their survival and in turn greatly influence plant growth, either negatively by damaging plants, or positively, by assisting in pollination or by adding nutrients to the soil as they break down leaf litter and other detritus. Virtually all parts of the plants are used including leaves, petioles, flowers, fruits, seeds, bark, trunks and roots. Non-flowering plants including liverworts, lichens, mosses, ferns, cycads and gymnosperms are also used to some extent as food for some moth larva as are some fruiting bodies of fungi. Ferns are generally avoided although some Australian larvae do feed on them. This is probably because ferns contain ecdysones, chemicals which are related to the moulting hormones of insects that may interfere with normal growth development.

Some adult adaptations for survival.

Nocturnal activity which is characteristic of most (but not all) moths, means they can avoid excessively high daytime temperatures and low humidity. In the daytime, these species hide in dark areas amongst leaf litter, in dense vegetation or under loose bark on tree trunks. Nocturnal activity also means that they can avoid diurnal predators such as insectivorous birds and lizards. However, during the night they are exposed to a different range of predators such as bats, spiders, frogmouths and owls.

Scales

The dense covering of overlapping scales (not hairs), characteristic of moths, provides insulation against extremes of temperatures. In cold climates these scales conserve body heat enabling flight to occur at temperatures that would otherwise be too low. In the more evolutionary advanced moths some of the scales are hollow, adding to their insulating properties.

Scales are also fairly easily detached and moths that come into contact with such things as spiders' webs or the sticky glandular hairs of sundew *Drosera* spp. can usually escape by leaving some of their scales behind.

The covering of scales is also responsible for the colours and patterns which play an important role in defence against predators. While most night-flying moths are cryptically coloured to blend in with their chosen resting places, day-flying moths are often aposematically (warning) patterned in shades of orange and black. In the animal world these colours are a sign that the moth may contain toxins or be distasteful to predators. In Australia, where many wasps are also orange and black, moths may escape predation by mimicking those species that inflict a painful sting. Caterpillars that live exposed on leaves also employ such colours but enhance this defence by a discharge of foul fluids, sudden movement, irritating hairs or specialised poisonous tufts.

Eye Spots

As in many butterflies, some moths wings also feature eye spots. These are usually situated on the hind wings and are hidden when the moth is at rest. But when disturbed into flight, these eye spots that strongly resemble vertebrate eyes startle its predator- usually insectivorous birds - allowing the moth to escape.

Ultrasound

Despite these defenses, both adult and larvae are an important food source many other insects, birds and especially bats. In some species, the relationship with bats includes the development of hearing organs that enables them to hear but ultrasound and thus take evasive action. This relationship has evolved to the extent that unpalatable moths emit an ultrasound that bats learn to associate with their unpleasant taste, just as birds learn the association of colours and taste in day-flying species.

Many moths are capable of producing sounds at both normal and ultrasonic frequencies by a process called stridulation. Stridulatory sounds are produced by rubbing some kind of scraper over a file-like structure which may or may not have a resonator.

Heat regulation

Below a certain temperature, characteristic for each species, the wing muscles of moths do not function properly and flight is not possible.

Unlike day flying butterflies that get radiant heat from the sun, moths must raise their temperature by a process akin to shivering. They vibrate their wings, slightly at first, then more rapidly as their thoracic temperature increases. Sustained flight is often preceded by walking, fluttering and short flights.

Role in environment.

Moths form an important food source for many vertebrates including birds, marsupials rodents, bats, frogs and lizards. Fan-tailed and other Cuckoos, much maligned by some for their habit of parasitising the nests of other birds, are notorious for eating hairy caterpillars that are rejected by other species. Cockatoos seek out the larvae of several species that bore into the heartwood of small trees, at Black Sugarloaf a quoll regularly visits our outdoor bathroom to take moths that become trapped inside.

Although a small percentage of the Australian moth fauna damage cultivated crops, forests and gardens, a much larger proportion are beneficial. Many feed on scale insects and other pests, some assist in the pollination of plants, while others are scavengers and feed on leaf litter and other organic matter, aiding the breaking down of these materials into valuable humus.

Several moth species have been deliberately introduced into Australia as biological control agents against exotic weeds. The most dramatic example of this was the introduction of *Cactoblastis cactorum* to control prickly pear. This weed had infested 20 million hectares of arable land in Queensland but in only a few years, this land was restored to grazing country with the elimination of all but a few plants.

Migration

Perhaps the best known occurrence of moth migration is that of the Bogong Moth *Agrotis infusa*. Vast aggregations of this species occur amongst the granite outcrops of the Bogong Mountains near Tumut in Southern New South Wales. Early European naturalists thought that these species bred locally, but it is now known that larvae cannot tolerate the cold mountain conditions but return to the mountains from larval feeding grounds often hundreds of kilometres away. The larvae are cutworms that damage crops in inland southern Queensland and South Australia. After a brief pupal period the adult moths move in a southerly direction, feeding on nectar as they go to build up fat reserves.

Many millions of moths congregate in crevices and outcrops on mountaintops above 1400 metres and spend three or four months in aestivation (pass summer in a dormant state) - a time when they neither feed or mate. In late summer they return to their breeding grounds to mate and lay eggs.

Thus, migration and aestivation allows this species to avoid the excessive heat of their breeding grounds during summer, when unpalatable perennial grasses are dominant and hot, dry conditions make survival difficult.

But long before European naturalists became aware of the migration of this species, the annual aggregations of Bogong Moths provided Aboriginal people with a focus for both economic and social activity, with initiation ceremonies, marriages and the settling of disputes taking place before the ascent to the mountains to gorge on moths.

With densities as high as 14,000 per square metre, this seasonally abundant resource has been exploited for several thousands of years by Aboriginal people who travelled considerable distances to feast for weeks, sometimes months on this rich source of fat.

Rainy nights

Now back to the question of numerous moths appearing on rainy nights. It seems that in some moth families (eg. some Noctuidae and Geometridae) pupation occurs in an earthen cell centimetres below the surface of the soil. In heavy clay soils it is difficult for adult moths to escape from such a cell unless it is moistened. Eclosion, ie. the shedding of the pupal cuticle by the adult moth is often triggered by rainfall in these species.

During a recent trip to far south-west Queensland, the landowner on whose place we camped, herself a keen naturalist, had often observed the phenomenon of the appearance of large moths from a westerly direction which foretold the coming rain. Perhaps the newly released moths were flying in advance of the rain front.

Thus moths, like other organisms, play a vital role in the ecology, and the study of their intricately organised lives can help us understand how best to care for and preserve our environment.(Common. 1990)

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Astacopsis gouldi Draft Recovery Plan

by Jim Nelson

The CNFN Inc. must express its frustration in trying to ensure a meaningful Recovery Plan for *Astacopsis gouldi*. After four years a Draft Plan was finally presented by the Recovery Team for approval by the Director of DPIWE. The Director then saw fit to change the major component of habitat protection which had been the subject of long deliberations by the Recovery Team, and these changes were issued as a published document asking for public comment without any further consultation with the Recovery Team. Further insult was visited upon the Recovery Team by including an incorrect statement that the Recovery Team had made the determination that riparian buffer strip habitat protection would not be prescriptive: "*the Recovery Team considers that undisturbed streamside buffers may be required on each side of some Class 3 and 4 streams.*" Upon complaint, a corrected version of the Draft Plan was issued, and public comment again invited. The corrected version simply omits mention of the Recovery Team specifically, saying "*As discussed in the Strategies Section, it is considered that...*" so the impression is still that the Recovery Team came to this wording. The Recovery Team realised that Strategies without adequate Actions make a Recovery Plan a meaningless document. The Director needs to come to this realisation.

The watering down of habitat protection to a meaningless level of discretion, rather than an Action with working prescriptions, does not meet the requirements of a Recovery Plan, which must fulfil the obligations for Recovery Plans under the Environment Protection And Biodiversity Conservation Act 1999, and therefore demonstrate the adequate abatement of the identified threats. Furthermore, we strongly believe the Precautionary Principle should always apply with regard to threatened species. The Rio Declaration on Environment and Development 1992 decided "*Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation*". The destruction of all the riparian vegetation along the Class 4 streams during forestry operation followed by burning could hardly be more environmentally damaging to an animal that every major researcher has identified as sensitive to degradation of stream systems. The argument that Class 4 steams haven't been scientifically proven under Tasmanian conditions to be important to the species ignores research from around the world on stream ecology, and is therefore nothing more than a mischievous quibble designed to continue delaying proper protection of the species. That such an argument is given any credence shows clearly the level of capitulation to the powerful forestry industry in Tasmania.

Warwick Nash, Deputy Director of Inland Fisheries, in defending the Draft Recovery Plan (INVERTEBRATA Nov. 2000) stated that "*In practice, however, economic or social factors as well as ecological ones are often taken into consideration when the Precautionary Principle is applied.*" He goes on to state that "*if the impacts of a particular precautionary measure are likely to be large, the evidence that such an action is necessary needs to be compelling for it to be incorporated into legislation or policy*". These arguments, in addition to their nonsensical interpretation of the Precautionary Principle, are spurious for the following reasons:

- Any economic impacts due to environmental reservation of habitat for *A. gouldi* were addressed by the extremely generous compensation to the Forest Industry through the RFA agreement. In signing that agreement, there was a conservation commitment to *A. gouldi* as a priority species to be protected outside the reserve system and within the Forest ecosystem. This obviously required restrictions for forestry within *A. gouldi* habitat areas, as forestry operations were identified as the prime threat for the animal within forested areas.
- The fact that no costing of impacts has ever been put forward by Forestry during the Recovery Team's deliberations demonstrates that the Forestry Corporation acknowledges the adequate compensation from additional available forests to offset any impacts involved in protecting this priority species. The Forestry Corporation's claim at the last Recovery Team meeting of the adverse impact of retaining stream buffers

must be seen as being without substance or integrity, and must be suspected to be a disrupting strategy to delay even further the proper protection of *A. gouldi*. The argument was not accepted by the Recovery Team, and for the Director of DPIWE to accept the argument blatantly puts the Recovery Plan in jeopardy through community opposition, thereby failing to deliver the species the protection commitments made in the RFA.

- That the Forestry Corporation's faulty and rejected argument against stream buffers was then taken to the Director of DPIWE, and that he was persuaded to unilaterally change the Recovery Plan insults the Recovery Team members, both the community members who have worked long and hard as volunteers on the Team, and the scientists whose expertise in weighing the habitat issues has been called into question. The arguments for stream buffers were carefully considered by the Recovery Team, and every Draft Plan (Bluhdorn 1997, Jackson, 1999, and the 2000 original) contained the buffer prescriptions for Class 4 streams (currently unprotected by buffers in forest practices).
- The compelling science was presented to the Recovery Team for stream buffers. The Growns Report 1995 on the effects of clearfelling on *A. gouldi* concluded: "*This study has shown that A. gouldi populations are virtually non-existent in streams of catchments that have been heavily disturbed by clearfelling within the Gog Range. Also, the catches of this species at sites in the undisturbed catchment were double that in the stream with the majority of its catchment covered by native vegetation but with some catchment disturbance. These results are supported by other literature, which indicates that habitat degradation or destruction can be detrimental to populations of freshwater crayfish in Australia and the Northern Hemisphere (Westman 1985, Geedes 1991, Merrick 1993, Horwitz 1994).*" Additionally, Dr. Peter Davies was commissioned to report to the Recovery Team and produced a 'Review of Astacopsis gouldi Recovery Plan'. His conclusion was that the "**first issue**" was "*the need to maintain the integrity of stream habitats and of instream and riparian processes*". Dr. Davies said at a meeting in Prospect that ecologists think the small headwater streams probably deserve more protection than the Class 1 and 2 streams in terms of maintaining stream integrity and biological inputs. Finally, one of Australia's premier stream ecologists, Dr. Paul Dignan's work in Victoria was cited stating that in most cases 30 metre buffer prescriptions might prove to be a minimum for Class 4 streams, and that such buffers would in fact need to be tested to see if they are adequate for Tasmanian conditions. Surely the argument for the ecologically sustainable forestry called for in the RFA, along with the goal to maintain biodiversity would mean that all Class 4 streams should have these buffers, and not just streams containing *A. gouldi*. Perhaps it is this broader conclusion that the Forestry Corporation does not want addressed?

Warwick Nash also stated in the INVERTEBRATA article that "*the recovery team provided the best advice on strategies to mitigate the threats to the species based on available knowledge.*" He goes on to say that the Director's changes in relation to 30 metre buffers "*resulted from a weighing of economic and environmental considerations*". If such considerations were available to be weighed, then why were they never presented to the Recovery Team in almost 4 years? If such considerations were not considered to be addressed by the concessions to the Industry in the signed RFA, then they needed to be part of the discussions of the Recovery Plan, and not addressed by withholding habitat protection. If there are important issues that impinge so strongly on the Recovery process, why are these issues being considered without any transparency or community scrutiny ?

Warwick Nash goes on to call for further studies that address the issues, and says that a Class 4 Stream Steering Committee has been set up comprising representatives from Forestry, the Forest Practices Board, Private Forestry and the Inland Fisheries Service to design further studies. The independence of this coalition of vested interests leaves much to be desired, given that they have all over the years either opposed or ignored the conservation of Class 4 streams. Will these studies specifically address the economic considerations that are apparently needed to put proper protection in place for *A. gouldi*? Should we have any faith at all that these studies will result in similar findings from around the world showing the importance of small streams? Meanwhile, during the proposed lengthy studies the habitat for the species decreases daily. There seems little doubt after all these years of the real agenda. The longer the delay, the less habitat to worry about.

Not only do we not support this Draft, but we will actively and publicly oppose it in the media, in the parliaments and to the Federal Minister for the Environment, pointing out that the RFA has not been properly complied with and that the Plan does not meet Recovery Plan objectives. We see this Recovery Plan as marking a sad day for threatened species in Tasmania, and *A. gouldi* in particular.